

Claims

What is claimed is:

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1. A track joint assembly adapted to connect a track chain together, the track chain having first and second structures the track joint assembly comprising:
a track pin extending between the first and second structures; and
an insert surrounding a portion of the track pin, the insert being free floating positioned between the track pin and one of the first or second structures.
2. The track joint assembly of claim 1, wherein the insert has at least one crown shaped surface thereon.
3. The track joint assembly of claim 2, wherein the insert has an outermost portion and the crown shaped surface is at least partially located at the outermost portion of the insert.
4. The track joint assembly of claim 2, wherein the insert has an outer surface with an outermost portion and the crown shaped surface has a crown positioned at a substantially central location along the outer surface of the insert at the outermost portion.
5. The track joint assembly of claim 2, wherein the crown shaped surface is curvilinear.

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6. The track joint assembly of claim 2, wherein the one of the first or second structures has an inner surface to facilitate sliding rotation with the crown shaped surface on the insert

7. The track joint assembly of claim 2, wherein the insert is free floating positioned between the track pin and the first structure and includes a sleeve positioned within the first structure and having an inner surface to facilitate sliding rotation with the crown shaped surface on the insert.

8. The track joint assembly of claim 1, wherein the insert is free floating positioned between the track pin and both the first and second structures.

9. The track joint assembly of claim 8, wherein the insert has at least one crown shaped surface thereon.

10. The track joint assembly of claim 1, wherein the one of the first or second structures has at least one crown shaped surface thereon.

11. The track joint assembly of claim 10, wherein the one of the first or second structures has an inner surface the crown shaped surface being located at the inner surface of the one of the first or second structures.

12. The track joint assembly of claim 11, wherein the crown shaped surface has a crown positioned at a substantially central location along the inner surface of the one of the first or second structures.

13. The track joint assembly of claim 11, wherein the insert has a outer surface to facilitate sliding rotation with the inner surface of the one of the first or second structures.

14. The track joint assembly of claim 10, wherein the crown shaped surface is curvilinear.

15. The track joint assembly of claim 1, wherein the insert has a length, a thickness and inner and outer diameters, the length to inner diameter being within an optimal range of 0.4-0.8 and the thickness to outer diameter being within an optimal range of 0.04-0.12.

16. The track joint assembly of claim 15, wherein the insert has an outer surface incorporating the surface of the outer diameter and at least one crown shaped surface located along the outer surface at the outer diameter.

17. The track joint assembly of claim 15, wherein the outer diameter has an outer surface that defines the crown shape surface.

18. A joint assembly, comprising:
first and second structures having limited movement relative to one another;
a pin extending between the first and second structures; and
an insert surrounding a portion of the pin, the insert being free floating positioned between the pin and one of the first or second structures.

19. The joint assembly of claim 18, wherein the insert has at least one crown shaped surface thereon.

20. The joint assembly of claim 19, wherein the insert has an outermost portion and the crown shaped surface is located at least partially at the outermost portion of the insert.

21. The joint assembly of claim 19, wherein the insert has an outer surface with an outermost portion and the crown shaped surface has a crown positioned at a substantially central location along the outer surface of the insert at the outermost portion.

22. The joint assembly of claim 19, wherein the crown shaped surface is curvilinear.

23. The joint assembly of claim 19, wherein the one of the first or second structures has an inner surface to facilitate sliding rotation with the crown shaped surface on the insert.

24. The joint assembly of claim 19, wherein the insert is free floating positioned between the track pin and the first structure and includes a sleeve positioned within the first structure and having an inner surface to facilitate sliding rotation with the crown shaped surface on the insert.

25. The joint assembly of claim 18, wherein the insert is free floating positioned between the pin and both the first and second structures.

26. The track joint assembly of claim 25, wherein the insert has at least one crown shaped surface thereon.

27. The joint assembly of claim 18, wherein the one of the first or second structures has at least one crown shaped surface thereon.

28. The joint assembly of claim 27, wherein the one of the first or second structures has an inner surface, the crown shaped surface being located at the inner surface of the one of the first or second structures.

29. The joint assembly of claim 28, wherein the crown shaped surface has a crown positioned at a substantially central location along the inner surface (39) of the one of the first or second structures.

30. The joint assembly of claim 28, wherein the insert has a outer surface to facilitate sliding rotation with the inner surface of the one of the first or second structures.

31. The joint assembly of claim 27, wherein the crown shaped surface is curvilinear.

32. The joint assembly of claim 18, wherein the insert has a length, a thickness and inner and outer diameters the length to inner diameter being within an optimal range of 0.4-0.8.

33. The joint assembly of claim 18, wherein the insert has a length, a thickness and inner and outer diameters, the thickness to outer diameter being within an optimal range of 0.04-0.12.

34. The joint assembly of claim 32, wherein the insert has an outer surface incorporating the surface of the outer diameter and at least one crown shaped surface located along the outer surface at the outer diameter.

35. The joint assembly of claim 32, wherein the outer diameter has an outer surface that defines the crown shape surface.

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36. The joint assembly of claim 33, wherein the insert has an outer surface incorporating the surface of the outer diameter and at least one crown shaped surface located along the outer surface at the outer diameter.

37. The joint assembly of claim 33, wherein the outer diameter has an outer surface that defines the crown shape surface.

38. A joint assembly adapted to connect a first structure to a second structure, the joint assembly comprising:

a pin extending between the first and second structures; and
an insert being positioned within one of the first or second structures for surrounding a portion of the pin the insert having at least one crown shaped surface thereon.

39. The joint assembly of claim 38, wherein the first and second structures move relative to one another.

40. The joint assembly of claim 38, wherein the crown shaped surface is curvilinear.

41. The joint assembly of claim 38, wherein the insert has an outer surface that defines the crown shape.

42. The joint assembly of claim 38, wherein the insert has an outer surface with an outermost portion and the crown shaped surface has a crown positioned at a substantially central location along the outer surface of the insert at the outermost portion.

43. The joint assembly of claim 38, wherein the insert has an outer surface with an outermost portion and the crown shaped surface has a crown positioned offset from a central location along the outer surface of the insert at the outermost portion.

44. The joint assembly of claim 38, wherein the insert is free floating positioned between the pin and the one of the first and second structures.

Sub Cl 1 45. A joint assembly adapted to connect a first structure to a second structure, the joint assembly comprising:

 a pin extending between the first and second structures; and
 an insert being positioned within one of the first or second structures for surrounding a portion of the pin, the one of the first and second structures having at least one crown shaped surface thereon.

46. The joint assembly of claim 45, wherein the first and second structures move relative to one another.

47. The joint assembly of claim 45, wherein the crown shaped surface is curvilinear.

48. The joint assembly of claim 45, wherein the one of the first and second structures has an inner surface that defines the crown shape.

49. The joint assembly of claim 45, wherein the one of the first and second structures has an inner surface with an innermost portion and the crown shaped surface has a crown positioned at a substantially central location along the inner surface of the one of the first and second structures at the innermost portion.

50. The joint assembly of claim 45, wherein the one of the first and second structures has an inner surface with an innermost portion and the crown shaped surface has a crown positioned offset from a central location along the inner surface of the one of the first and second structure at the innermost portion.

51. The joint assembly of claim 45, wherein the crown shaped surface is adjacent the insert.

52. The joint assembly of claim 45, wherein the insert is free floating positioned between the pin and the one of the first and second structures.

53. A joint assembly adapted to connect a first structure to a second structure, the joint assembly comprising:

 a pin extending between the first and second structures; and
 an insert being positioned within both the first and second structures for surrounding a portion of the pin, the insert having at least one crown shaped surface thereon.

54. The joint assembly of claim 53, wherein the first and second structures move relative to one another.

55. The joint assembly of claim 53, wherein the crown shaped surface is curvilinear.

56. The joint assembly of claim 53, wherein the insert has an outer surface that defines the crown shape.

57. The joint assembly of claim 53, wherein the insert has an outer surface with an outermost portion and the crown shaped surface has a crown positioned at a substantially central location along the outer surface of the insert at the outermost portion.

58. The joint assembly of claim 53, wherein the insert has an outer surface with an outermost portion and the crown shaped surface has a crown positioned offset from a central location along the outer surface of the insert at the outermost portion.

59. The joint assembly of claim 53, wherein the insert is free floating positioned between the pin and the first and second structures.

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